

Customer No.: 31561
Application No: 10/709,925
Docket No.: 11238-US-PA

REMARKS

Present Status of the Application

The Office Action rejects claims 1-2, 4 and 6 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action rejects claims 1, 4, 7, 10 and 12 under 35 U.S.C. 102(b) as being anticipated by McCormick (US 6369448). The Office Action rejects claims 1-2 and 7-8 under 35 U.S.C. 102(b) as being anticipated by Klein et al. (US Pat. Pub. 2004/0145051). The Office Action rejects claims 6 and 13-14 under 35 U.S.C. 103(a) as being unpatentable over McCormick in view of Venkateshwaran et al. (US 6339253).

Upon entry of the amendments in this response, claims 1 is amended by incorporating the limitation of the original claims 2 and the feature supported by paragraph [0029] and Fig. 2, and claim 2 is thus canceled. Claims 7 is amended by incorporating the limitation of the original claims 8 and the feature supported by paragraph [0029] and Fig. 2, and claim 8 is thus canceled. Hence, claims 1, 4, 6-7, 10 and 12-14 remain pending in the present application. Reconsideration and withdrawal of the rejections are respectfully requested.

Response to Rejection under 35 U.S.C. 112

The Office Action rejects claims 1-2, 4 and 6 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites a limitation regarding the first chip and a second chip which is not shown in the instant invention. In detail, in claim 1, a

Customer No.: 31561
Application No: 10/709,925
Docket No.:11238-US-PA

second chip cannot be over the active surface of the first chip, meanwhile satisfying $h3 \geq h1 + h2$.

Applicants have amended claim 1 by replacing the preposition "over" with the preposition "under" for clarity. Accordingly, reconsideration and withdrawal of the 112 rejection are respectfully requested.

Response to Rejection under 35 U.S.C. 102(a)

The Office Action rejects claims 1, 4, 7, 10 and 12 under 35 U.S.C. 102(b) as being anticipated by McCormick. Applicants respectfully transverse the rejection as it applies to claim s 1, 4, 7, 10 and 12 for at least the reasons set forth below.

The independent claim 1, as amended by incorporating the limitation of claim 2, recites as follows.

1. A multi-chip package module, comprising:
a first chip having an active surface;
a second chip positioned under the active surface of the first chip as a flip -chip structure, wherein a height of the second chip in a direction perpendicular to the active surface is defined as $h1$;
a plurality of first bumps positioned between the active surface of the first chip and the second chip, wherein a height of the first bumps in the direction perpendicular to the active surface is defined as $h2$;
a plurality of contacts, protruding from the active surface of the first chip, wherein a height of the contacts in the direction perpendicular to the active surface is defined as $h3$, and values of $h1$, $h2$, and $h3$ are related by an inequality of $h3 \geq h1 + h2$; and
an underfill film made from an insulating material and formed over the active surface of the first chip, wherein each of the contacts comprises a plurality of stacked second bumps, and the underfill film covers the stacked second bumps of the contacts and exposes the top surface of the contacts.

(emphasis added)

Customer No.: 31561
Application No: 10/709,925
Docket No.: 11238-US-PA

The independent claim 7, as amended, also recites the similar features.

McCormick, however, discloses solder bumps (Item 414 in Fig. 4) on the top chip (Item 410 in Fig. 4), but the solder bumps does not have a plurality of sub-bumps stacked over each other.

Therefore, McCormick does not anticipate claims 1 and 7, since McCormick does not disclose each and every element of claims 1 and 7. Consequently, McCormick does not anticipate claim 4 dependent on claim 1 as matter of law, and does not anticipate claims 10 and 12 dependent on claim 7 as matter of law.

Accordingly, Applicants respectfully submit that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

Response to Rejection under 35 U.S.C. 102(a)

The Office Action rejects claims 1-2 and 7-8 under 35 U.S.C. 102(h) as being anticipated by Klein et al. Applicants respectfully transverse the rejection as it applies to claims 1-2 and 7-8 for at least the reasons set forth below.

The independent claim 1, as amended, recites as follows.

1. A multi-chip package module, comprising:
a first chip having an active surface;
a second chip positioned under the active surface of the first chip as a flip -chip structure, wherein a height of the second chip in a direction perpendicular to the active surface is defined as h1;

Customer No.: 31561
Application No: 10/709,925
Docket No.: 11238-US-PA

a plurality of first bumps positioned between the active surface of the first chip and the second chip, wherein a height of the first bumps in the direction perpendicular to the active surface is defined as h_2 ;

a plurality of contacts, protruding from the active surface of the first chip, wherein a height of the contacts in the direction perpendicular to the active surface is defined as h_3 , and values of h_1 , h_2 , and h_3 are related by an inequality of $h_3 \geq h_1 + h_2$; and

an underfill film made from an insulating material and formed over the active surface of the first chip, wherein each of the contacts comprises a plurality of stacked second bumps, and the underfill film covers the stacked second bumps of the contacts and exposes the top surface of the contacts.

(emphasis added)

The independent claim 7, as amended, also recites the similar features.

Klein, however, discloses two separated layers of encapsulant (Item 16 & 120 in Fig. 9A) cover two separated contacts (Item 52 & 118 in Fig. 9A) respectively, but does not disclose a single layer of encapsulant cover two separated contacts.

Therefore, Klein does not anticipate claims 1 and 7, since Klein does not disclose each and every element of the claim.

Accordingly, Applicants respectfully submit that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

Response to Rejection under 35 U.S.C. 103(a)

The Office Action rejects claims 6 and 13-14 under 35 U.S.C. 103(a) as being unpatentable over McCormick in view of Venkateshwaran et al. Applicant respectfully

Customer No.: 31561
Application No: 10/709,925
Docket No.: 11238-US-PA

traverse the rejection as it applies to claims 6 and 13-14 for at least the reasons set forth below.

If the claims 1 and 7 are allowable and patentable over the cited references, claim 6 dependent on claim 1 and claims 13-14 dependent on claim 7 are allowable and patentable over the cited references as a matter of law.

Accordingly, Applicants respectfully submit that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

Customer No.: 31561
Application No: 10/709,925
Docket No.: 11238-US-PA

CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1, 4, 6-7, 10 and 12-14 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,



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